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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,616	06/26/2001	Murray J. Thomson	2223-105	8527
1059	7590	10/07/2003	EXAMINER	
BERESKIN AND PARR SCOTIA PLAZA 40 KING STREET WEST-SUITE 4000 BOX 401 TORONTO, ON M5H 3Y2 CANADA			PRICE, CARL D	
			ART UNIT	PAPER NUMBER
			3749	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/888,616

Applicant(s)

THOMSON ET AL.

Examiner

CARL D. PRICE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03-17-03, 07-16-03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-61 is/are pending in the application.
- 4a) Of the above claim(s) 22-41 is/are withdrawn from consideration.
- 5) ☒ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 42-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Applicant's election without traverse of the invention of Group I, claims 42-61, in Paper No. 11 is acknowledged.

Claims 22-41 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in Paper No. 11.

This application contains claims 22-41 drawn to an invention nonelected with traverse in Paper No. 11. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Response to Arguments

Applicant's arguments with respect to claims 42-61 have been considered but are moot in view of the new ground(s) of rejection.

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The prior art reference of Von Dresek et al is now relied on to address the invention as set forth in applicant's newly submitted claims.

Drawings

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement figures which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments, or remarks, section of the amendment. Any replacement drawing sheet must be identified in the top margin as "Replacement Sheet" and include all of the figures appearing on the immediate prior version of the sheet, even though only one figure may be amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin.

Annotated Drawing Sheets

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheets must be clearly labeled as "Annotated Marked-up Drawings" and accompany the replacement sheets.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may **NOT**

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be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

37 CFR 1.121. Manner of making amendments in application.

(d) Drawings . Application drawings are amended in the following manner: Any change to the application drawings must be submitted on a separate paper showing the **proposed changes in red** for approval by the examiner. Upon approval by the examiner, new drawings in compliance with §1.84 including the changes must be filed.

The drawings were received on 03-21-2003. Since applicant has not provided a separate paper showing the proposed changes in red for approval by the examiner, these drawings are not acceptable.

Also, the amendment to the drawing figure 4, filed 03-21-2003, is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: For example, in amended figure 4, applicant has added and “emitter”, changed the illustrated signal flow through the “beam splitter” and indicating a 10% and 90% signal distribution, Elements previously referenced by numerals “46” and “55”, as well as one “detector”, have been removed, and an additional signal path has been added between the “Transmitter/Receiver board” and connector “50”. These changes constitute new matter in that they present an arrangement of the invention not previously supported by the disclosure.

Applicant is required to cancel the new matter in the reply to this Office Action.

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Specification

The disclosure is objected to because of the following informalities: The data "Table 1" appearing on page 17 of the specification is rough and blurred.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 42-61 are rejected under 35 U.S.C. 103(a)

Claims 42-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calabro et al (of record) in view of Von Drasek et al (U.S. Patent No.- 2002/0031737)(newly cited).

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Calabro et al discloses a process for control of a combustion application. Calabro et al shows and discloses a combustion control system process including operating a fuel oxidant supply and operating in response to a distributed feedback (DFB) tunable laser diode (see column 9, line 35). Calabro et al further discloses (column 7, line 47-50) selecting suitable types of laser diodes for a given application, such as GaAlAs diodes which operates in the near infrared bands of 1-2um. Calabro et al discloses applying the disclosed control to monitor chemical species such as O₂, CO, CO₂ and H₂O.

Von Drasek et al teaches, from the same laser diode combustion control field of endeavor as Calabro et al, analyzing detected laser beams for CO and H₂O. And, determining CO concentrations from the CO and H₂O absorption lines.

Von Drasek et al discloses:

“A primary objective of the present invention is to provide a method to monitor and, preferably, control the performance of an industrial combustion space, where performance may refer to global stoichiometry, or zone stoichiometry of the process, **gas temperature**, particulate density, or air entrainment level. One or more of the performance criteria can be monitored simultaneously.”

Von Drasek et al also discloses:

“A fourth aspect of the invention is **a method for monitoring temperature of gas phase of a process, preferably an oxy-fuel combustion process, comprising the steps of:**

[0033] a) launching an initial collimated beam of radiation emitted by tunable diode laser along a line-of-sight path through the combustion process;

[0034] b) **tuning the diode laser over two or more rotational lines of the selected species; (CO and or O.sub.2 can be used for temperature monitoring**

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however the preferred species is H_2O or another detectable process gas that may be present, e.g., HCl . Whichever species is chosen it is preferred that the dependence on process stoichiometry is minimal. For near infrared monitoring of H_2O (numerous absorption transitions exist in the 1.4, 1.5 and 2.0 μm spectral region that is accessible by near infrared diode lasers) from hydrocarbon fueled combustion processes, both CO and O_2 concentrations are strongly dependent on the process operating conditions, and one may encounter cases where no detectable levels of either species is observed, i.e., concentration too low for temperature determination. For this reason, and the fact the H_2O is present in the vast majority of combustion processes makes it an ideal candidate for temperature monitoring oxy-fuel combustion process and others where H_2O is known to be present.)

[0035] c) opposite the launch position the transmitted radiation is collected and transported to a photo detector (sensitive at the wavelength of interest) having a filter element; (The filter element is preferably either a narrow band reflector or transmitting optic and/or a dispersing element for use in suppressing background radiation from hot walls and/or particles.)

[0036] d) processing the optical signal by observing the amount of attenuation observed from the initial beam as the laser is tuned over two or more resonance absorption lines; (The temperature is obtained by applying the following expression $R = (S_1/S_2) T_o \cdot \exp[-hc/E_k(1/T - 1/T_o)]$

[0037] where R is the ratio of the integrated absorbance of each transition at the unknown temperature T . The right hand side of the expression is composed of all known parameters except T . $(S_1/S_2) T_o$ is the ratio of the line strength values at some reference temperature, T_o , ΔE is the energy separation of the absorbing states, h is Planck's constant, k is Boltzmann's constant and c is the speed of light.) and

[0038] e) producing an electrical signal based on the temperature of gas phase for use in regulation of one or more of the following variables: process pressure, fuel inlet flow rate, and oxidant inlet flow rate."

Von Drasek et al also discloses:

"A further aspect of the invention is a means to monitor pollutant X where X is a pollutant of specific interest to a process. For example, X can be NO or SO in exhaust of a process flue or at a specified location in the process. The method for monitoring comprising the steps:

[0062] a) launching an initial collimated beam of radiation emitted by tunable diode laser along a line-of-sight path through the combustion process; (For monitoring species X , the preferred method consists of monitoring one of the absorption transitions in the near infrared that is free of interfering background species such as H_2O .)

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[0063] b) opposite the launch position the transmitted radiation is collected and transported to a photo detector having a filter element; (The detector is preferably a silicon photo-diode, photomultiplier tube, or similar photo detector with sensitivity in the spectral region of species X. The filter element can be either a narrow band reflector or transmitting optic and/or a dispersing element for use in suppressing background radiation.)

[0064] c) **processing the optical signal by observing the amount of attenuation observed from the initial beam as the laser is tuned over a resonance absorption line of species X;** (The integrated area of the absorption line is directly proportional to the number density for a given temperature.) and

[0065] d) producing an electrical signal based on the number density of species X. The electrical signal may be useful in controlling one or more of the following variables: process pressure, fuel inlet flow rate, and oxidant inlet flow rate.

[0066] **The inclusion of additional combustion species such as NO and/or SO with the main monitoring species set namely O.sub.2, CO, and H.sub.2O provides a means to fully characterize the exhaust gas and/or zone of a combustion process. Since diode lasers cover a broad wavelength range the limitations for detecting a specific species is dictated by the physics of the absorption process. For example, some species are not infrared active such as N.sub.2. While other species that are infrared active have limited use due to weak absorption transitions and/or interference by other species in the measurement volume. “**

In regard to claims 42-61, for the purpose of determining the CO concentration, it would have been obvious to a person having ordinary skill in the art to detect and monitor CO and H₂O absorption lines so as to determine transitions in the near infrared that is free of interfering background species such as H₂O, in view of the teaching of Von Dresek et al. In regard to claim 43, in particular, Official Notice is taken that it is well known to use predetermined calibration curves containing operating values representative of optimal system parameters to compare with sense or observed system signals in order to determine necessary system control operations. Thus, in view of that which is well known and for the known purpose, it would have been

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obvious to a person having ordinary skill in the art to compare the sensed signals in Calabro et al with predetermined calibration curves.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

THIS ACTION IS MADE FINAL.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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USPTO CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CARL D. PRICE whose telephone number is 703-308-1953. The examiner can normally be reached on Monday through Friday between 6:30am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennett can be reached on 703-308-0101. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-1148/0858.



CARL D. PRICE
Primary Examiner
Art Unit 3743

cp
September 30, 2003